



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

FMCSF 4.3
FMAR 4.2
4/19/93

EXPLANATION OF SIGNIFICANT DIFFERENCES

INTRODUCTION

Site name and Location:

FMC Corporation
Yakima, Washington

Lead and support agencies:

U.S. Environmental Protection Agency (EPA)
Washington State Department of Ecology

Statute that requires Explanation of Significant Differences (ESD):

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 117(c) and National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Section 300.435(c)(2)(i).

Need for an ESD:

During the course of the remedial action at the site, several changes to the remedy have proven to be necessary to account for unforeseen problems with excavation, the need for more extensive and deeper excavation than expected, and the development of new RCRA cleanup criteria which EPA determined were appropriate to apply to the cleanup. These changes encompass the following:

- 1) Minor change in soil cleanup criteria from a risk of 1×10^{-6} to 5×10^{-6} in response to engineering impracticability.
- 2) Increase in volume of soil to be excavated.
- 3) Determination that excavated cobble met the cleanup standards for soil and did not require treatment.
- 4) Change in the cleanup criteria for the warehouse floor.



Administrative Record:

This ESD will become part of the Administrative Record for the FMC Corporation Superfund site, which is available to the public at the following two locations:

Yakima Valley Regional Library
102 Third Street
Yakima, Washington 98901

U.S. Environmental Protection Agency
1200 Sixth Avenue, HW-113
Seattle, Washington 98101

SITE BACKGROUND

FMC operated a plant to manufacture pesticide dusts and liquids on the site from 1951 to 1986. Pesticide dusts were formulated at the facility throughout its operation. Liquid products were formulated in the 1970s.

Between 1952 and 1969, FMC disposed of wastes containing pesticides in an on-site pit. The location of the pit was determined using historical aerial photographs, and confirmed during the Phase I Remedial Investigation (RI) conducted by Bechtel Environmental, Inc. (Bechtel), in 1987. An estimated 2000 lbs. of materials were discarded in the pit. Raw material containers, soil contaminated by leaks or spills from process equipment, broken bags, and off-specification materials were dumped into the excavated pit and covered with dirt. After 1969, waste materials were disposed of at Yakima Valley Disposal and Chem Securities in Arlington, Oregon. In 1982, the site was placed on the National Priorities List (NPL), based on high levels of pesticides. In 1986, after operations at the facility had ceased, FMC conducted a preliminary cleanup of the facility that included removal of all contents of the main facility warehouse and surface tanks, and washing the of warehouse floors and walls.

On July 31, 1987, EPA issued an Administrative Order On Consent requiring and authorizing FMC to conduct a Remedial Investigation/Feasibility Study (RI/FS) for the site. In November 1987, RI Phase I sampling conducted by FMC's consultant, Bechtel Environmental, Inc., confirmed "hot spots" of DDT and other pesticide contamination in the former disposal pit at levels of up to 25,000 mg/kg. Consequently, an Order On Consent For Necessary Response Actions was issued by EPA on May 31, 1988. Pursuant to this order, FMC performed a removal and properly disposed of the pit's contaminants.

The Phase I removal of the contents of the former disposal pit was performed in June 1988. The pit was excavated to a depth of 4 feet (the depth of the groundwater table at the time), and 500 tons of contaminated soil was removed. In March 1989, an additional 350 tons of soils were removed, which increased the depth of the excavation to approximately 8 feet. In both cases, the waste was disposed of in a permitted hazardous waste disposal facility.

A Phase II RI was conducted to investigate the rest of the site. The study, was completed in April 1990, and a Record of Decision (ROD) outlining the final site cleanup was issued September 14, 1990.

FMC agreed to implement the remedial action in a Consent Decree entered in the Eastern District of Washington on December 6, 1991. Design work on the project was completed in the Spring of 1992 with the remedial action commencing concurrently. The remedial action is expected to be completed in the summer of 1993.

CONTAMINANT PROBLEMS

As a result of site pesticide formulation operations, site soils, both surface and subsurface, and on-site buildings and concrete sumps and pads were contaminated with pesticides. The contaminants of concern for human health at the site are DDD (1,1-dichloro-2,2-bis(p-chlorophenol) ethane), DDE (1,1,-dichloro-2,2-bis(p-chlorophenol) ethylene), DDT (1,1,1-trichloro-2,2-bis(p-chlorophenol) ethane), dieldrin, endosulfans, malathion, ethion, ethyl parathion, parathion, DNOC (4,6-dinitro-o-cresol), cadmium, and chromium VI. All of these compounds are considered toxic. Cadmium, chromium VI, DDD, DDE, DDT, and dieldrin are also carcinogenic. The contaminants of concern for potential environmental effects are DDD, DDE, DDT, endosulfans, ethion, malathion, and zinc.

Groundwater contamination has been found at low concentrations, most notably the organo-chlorines (DDT, DDD and DDE) and endosulfans. Since the removal of material from the disposal pit in 1988 and 1989, pesticide contamination in the groundwater has been below drinking water standards.

REMEDY SELECTED IN THE RECORD OF DECISION (ROD)

The selected remedy in the ROD addressed the remaining contaminated soils and structures at the site.

The selected remedy called for:

- Sampling of soils and concrete structures to refine the RI/FS estimate of the lateral and vertical extent of material requiring treatment,
- Excavation of contaminated soils exceeding cleanup levels,
- On-site incineration of contaminated soils,
- Dismantling of contaminated slabs and portions of the buildings that are determined to exceed cleanup goals,
- On-site incineration of contaminated concrete and debris or disposal at a RCRA-Subtitle C permitted hazardous waste disposal facility, depending on volume,
- Analysis of incinerator ash to determine the degree of contaminant destruction and leachability, and delisting of the ash if health-based cleanup goals are met,
- Groundwater monitoring for 5 years to confirm source removal.

Groundwater monitoring will continue quarterly for two years following completion of the remedial action, and then for three more years on an annual basis. If contamination is detected above the cleanup goals, and groundwater remediation proves to be necessary, it will be addressed in a subsequent ROD.

The ROD estimated the amount of contaminated soil at the site to be 900 to 4000 cubic yards.

SIGNIFICANT DIFFERENCES AND BASES FOR THEM

I) Change in Site Cleanup Goals:

Two changes in the site cleanup goals have become necessary as a result of the mechanical difficulties associated with excavation below the water table, and the discovery that the depth of the contamination in some areas was greater than expected.

- A) Change in cleanup goal from a risk of 1×10^{-6} to a risk of 5×10^{-6} for excavation at depths greater than 2 feet, but less than 7 feet below ground surface

The cleanup goals in the ROD were the attainment of an overall site hazard index of less than or equal to 1, and the

attainment of an overall site excess cancer risk of 1×10^{-6} , both based on a residential scenario. When site excavation began, the water table was at its seasonal low of approximately 7 feet below ground surface (bgs). Over the course of the excavation the water table rose to its seasonal high of 6 inches to 1 foot bgs. (The water table is at 7 feet bgs during the winter and early spring, and at 6 inches to 1 foot bgs the rest of the year.) The majority of the site excavation was of material below the water table. Excavation below the water table resulted in sloughing of the trenches and spillage of small quantities of excavated material back into the holes as the material was removed. Thus, minimal recontamination occurred as excavation progressed. Continued excavation was not able to alleviate the recontamination problem. In addition, some previously excavated areas became submerged and out of reach of the construction equipment, making re-excavation impossible.

The contaminant concentrations resulting from recontamination equate to risk levels well within the EPA acceptable risk range of 1×10^{-6} to 1×10^{-4} . To account for the technical impracticability of reaching the original 1×10^{-6} cleanup goal, EPA adjusted the cleanup goal (and the contaminant levels associated with it) to a risk of 5×10^{-6} for areas below 2 feet (which is below the high water table) to avoid ineffective attempts at excavation of residual contamination. For most of the site, the material with concentrations above the adjusted cleanup goal was removed by excavations ranging from 2 feet to 7 feet bgs. The areas where contaminant depth exceeded 7 feet bgs are discussed below.

- B) Determination that the extent of the excavation would not exceed 7 feet below ground surface

Samples from 7 feet bgs taken during excavation of the drum washing area and the tank farm (two adjacent areas on the southern end of the site), contained contaminant concentrations equating to risk levels above the cleanup goals. EPA determined that excavation below 7 feet was technically impracticable, and that the material did not pose an exposure risk or a threat to the groundwater based on the following:

- 1) The water table in the area fluctuates from a depth of 7 feet bgs to a high level of 6 inches to 1 foot bgs. There is no chance of incidental direct exposure to soil 7 feet bgs which is always underwater. In addition, because the high water table is at 6 inches to 1 foot bgs, there is no potential for future subsurface construction leading to exposure of the remaining contaminated soil. Because there is no probable current or future exposure to this material it does not present a direct exposure risk.

2) Prior to excavation of the site, the contaminant levels in the groundwater were below the ROD action levels. The bulk of the contamination has been removed during this remedial action, reducing the impact on the groundwater. The groundwater will be monitored for 5 years following the completion of the remedial action. If contaminant levels are found above action levels, EPA will evaluate the need for implementing a groundwater remedy.

II) Change in Volume of Soil to Be Excavated:

The ROD estimated that there would be from 900 to 4000 cubic yards of contaminated material. As a result of contamination extending deeper than expected, approximately 5200 cubic yards of material was excavated.

III) Determination that Cobble Met the Soil Remediation Requirements and So Did Not Require Incineration:

Approximately one third of the material excavated was cobble, approximately 2 to 6 inches in diameter. It was crushed and sampled, and found to meet the health based and RCRA based requirements of the Consent Decree Performance Standard. Therefore, the cobble did not require incineration prior to use as backfill.

IV) Modification to the Cleanup Criteria for the Warehouse Floor:

At the time the remedy for the site was selected, there were no promulgated cleanup standards applicable to buildings. EPA developed site specific criteria for the warehouse. The exposure assumptions for determining the cleanup criteria were based on contact with the walls. A wipe test using a filter to swab walls and floors was to be analyzed and the results compared to the cleanup standards.

Subsequent to the beginning of site excavation, RCRA developed technology based criteria for decontamination of concrete debris (57 Fed. Reg. 371904). The new RCRA criteria were developed to allow concrete to be disposed of, after the applicable treatment, without further testing. In the case of the warehouse, the cleanup criteria in the ROD were based on decontamination of the building for reuse. However, EPA has determined that it is appropriate to apply the new RCRA criteria to the warehouse floor.

The RCRA decontamination criterion applied at the site calls for scarification to a depth of 0.6 cm (approximately 1/4 inch), and removal of any additional visual staining. As part of the

remedial action, the warehouse floors were scarified to a depth of 1/4" or more and no visible contamination remained. It was therefore determined that the warehouse floors were clean. The floors will be restored during the remedial action to allow the building to return to functional use.

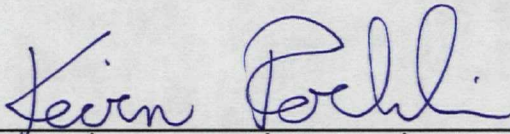
AFFIRMATION OF STATUTORY DETERMINATIONS

Considering the new information developed during the remedial action and the resulting changes in the selected remedy, EPA believes that the remedy remains protective of human health and the environment. The revised remedy utilizes permanent solutions to the maximum extent practicable for this site and is cost-effective. It complies with the NCP and other federal and state requirements that are applicable or relevant and appropriate to this remedial action.

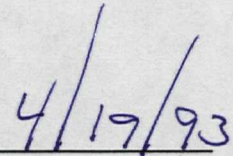
PUBLIC PARTICIPATION ACTIVITIES

This ESD will become a part of the Administrative Record for the site. Because there has been little community interest in the site, the ESD will be made available to the public, but will not be distributed for public comment. For additional information regarding this ESD, please contact the Superfund Site Manager for the FMC Corporation site:

Kevin Rochlin
1200 Sixth Avenue, HW-113
Seattle, Washington 98101
(206) 553-2106



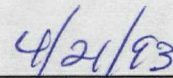
Kevin Rochlin, Remedial Project Manager



Date



Randall F. Smith, Director, Hazardous Waste Division



Date